

ocellus is conspicuous. The occipital spot, however, is not yet well formed. This stage represents the final post-larval stage which grows and leads on to the 'young adult', 14.7 mm. long, described in the earlier paper (Job, p. 69).

SUMMARY.

Some of the early stages in the development of *Aplocheilus lineatus* are described. Eyed ova were collected from a natural habitat of the fish and hatched in aquaria. The salient features in the development of the species are more or less similar to those of *A. panchax*, but the Kupfer's vesicle is not distinct in *A. lineatus*, and the developing embryo occupies a greater space inside the egg-membrane. The characters of the hatchling with its peculiar habit of adhering to objects are described. The changes undergone by the larva in its growth up to the 11 mm. size are described. The 11 mm. size represents the final post-larval stage of the fish, after which it assumes the adult characters.

REFERENCES¹.

- Bannerman, W. B.—'Note on Dr. Bentley's paper "The Natural History of Malaria (sic.)"'. *Journ. Bombay Nat. Hist. Soc.*, xx, pp. 525, 526, (1910).
 Job, T. J.—'On the Breeding and Development of Indian "Mosquito-fish" of the genera *Aplocheilus* McClelland and *Oryzias* Jordan and Snyder'. *Rec. Ind. Mus.*, xlii, pp. 51-79, (1940).
 Prashad, B. and Hora, S. L.—'A General Review of the Probable Larvivorous Fishes of India'. *Rec. Mal. Surv. Ind.*, vi, pp. 631-648, (1936).
 Willey, A.—'Observations on the Nest, Eggs and larvae of *Ophiocephalus striatus*'. *Spolia Zeylanica*, vi, pp. 108-122, (1910).

S. JONES, M.Sc.,

Travancore Central Research Institute, Trivandrum.

July 1940.

T. JOB, M.Sc.

Lady Tata Memorial Research Scholar, Calcutta.

XX.—BUTTERFLIES ATTRACTED BY MOIST EARTH.

On page 646 of volume xli No. 3 of the *Journal*, Capt. W. C. Carrot mentions coming across thousands of the butterfly *Appias nero galba* gathered on the sand near a stream. This peculiarity of collecting together in large numbers and sitting on damp spots and sucking up the moisture is a common occurrence with certain families of butterflies, though not of all species of some families. *Troides*, *Tros*, *Chilasa*, *Papilio*, *Pathysa*, *Zetides*, *Paranticopsis*, *Appias* and *Huphina* amongst others very commonly have this habit. But what is interesting about this habit is the reason for it. Why do these butterflies collect and suck at the damp earth in this way? The places at which they congregate are extremely local and cover a definite area small or large as the case may be,

¹ For further related literature such as Moody (1939), Stoye (1935), Mellen and Lanier (1935), Fraser (1938) and Innes (1939), see Job, 1940.

beyond which few if any butterflies will be seen sampling the moisture, although the earth or sand has the same appearance as the area on which they are sitting—at least this has been my experience. Moreover day after day butterflies will be found on the same spot but not on others adjacent to it, which have identically the same appearance. Has it ever been investigated what it is in the moisture which attracts particularly butterflies and not other insects, such as flies? I am not speaking of areas where there has been carrion or other dirt but merely plain damp areas in earth or sand. Have samples of the earth where butterflies settle in such hundreds at times ever been analysed to find out if there is any component in these patches which is not found in adjacent areas? Is there some organic substance in the earth which is particularly to their liking or is it some inorganic chemical? Do butterflies visit these spots in the same way that animals visit a salt lick? Furthermore it is only the males so far as I know which behave in this way. I have frequently experimented on a small patch by quietly placing my net over all the butterflies on it and killing them all and then watching the behaviour of other passing butterflies. It was quite apparent that these areas gave off some sort of scent for butterflies, particularly of the genus *Pathysa*, invariably exhibited great excitement when passing close to such a patch although there were no butterflies on it to give any indication of its nature. They would fly backwards and forwards over it after suddenly checking in their flight and finally they would settle—nearly always on the edge of the patch and then flutter and hop with perhaps a short flight or two towards the centre of the patch where they would start sucking in earnest occasionally ejecting drops of moisture from their anal extremities. Gradually more and more individuals would collect until there were as many as before. Another point is that I have seldom, if ever, seen these patches at heights above 3,500 feet where butterflies collect in such profusion as they do at lower elevations, particularly in the hot valleys at the foot of the hills.

Perhaps somebody has taken the trouble to investigate this matter more closely and has come to some definite conclusions. If so it would be very interesting to hear of them from other readers.

KOPJI VILLA,
AUKLAND ROAD,
DARJEELING,
BENGAL,

July 15, 1940.

R. E. PARSONS, F.R.E.S.,
Indian Police.

XXI.—ON THE LARVA OF THE MOTH (*CIRCULA TRIPERESTRATA*) AND THE DESTRUCTION OF THE COCOONS BY TREE SHREWS.

On looking through my notes I have come across the following occurrence, which is perhaps worth recording:—

One of the most common larvae to be found in and near Gauhati, Kamrup District, Assam, is that of the moth *Circula triperestrata*